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The Connecticut Agricultural Experiment Station, New Haven

White Supersweet and Sweet Breed™ Corn Trials 1997-1998

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SUMMARY

During 1998, six white supersweet (sh2) cultivars and five Sweet Breed™ (su + se + sh2) cultivars of corn were tested for cool soil germination in three plantings in late April through early May using clear plastic mulch and Reemay row covers to warm the soil. The tests were conducted at Windsor on a sandy terrace soil (Merrimac sandy loam) and at Mt. Carmel on a loamy upland soil (Cheshire fine sandy loam).

During 1997 and 1998 cultivar evaluation trials, six white supersweet cultivars and five Sweet Breed™ cultivars, respectively, were grown in late May (Crop 1), early June (Crop 2), and early July (Crop 3) at both sites.

In cool soil germination tests, clear plastic mulch and Reemay row covers warmed the soil at a 1-inch depth 14F and 9F, respectively, compared to bare soil in the April 22-24 planting. In subsequent plantings, April 29-30 and May 7-8, the heating effect was less pronounced as the maximum soil temperatures in bare soil rose from 71F in late April to 88F in early May. Increased soil temperature speeded germination under clear plastic mulch 3-11 days and 2-9 days under Reemay row covers at both sites compared to uncovered controls. Throughout the cool soil germination tests at Windsor, the greatest yields were observed in 36% of cultivars covered with clear plastic mulch, 40% covered with Reemay row covers, and 24% with no cover. At Mt. Carmel, 85% of cultivars had greatest yield under Reemay row covers, 6% under clear plastic mulch, and 9% with no cover. Some increases, however, were not great enough to compensate for the cost of material and labor, even at a retail price of $3.00/dozen ears. At a wholesale price of $1.50/dozen ears, a net profit for each cultivar in all plantings at both sites was rare. For April plantings, however, cultivars that responded well to temperature modification were white supersweet cultivars Sweet Magic, Ultra, and Pegasus. Among the Sweet Breed™ cultivars, Sweet Rhythm and Sweet Symphony were the most responsive under both covers.

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White Supersweet and Sweet Breed™ Corn Trials 1997-1998

By David E. Hill

In the United States, sweet corn is a vegetable staple enjoyed by millions throughout the year. It is eaten on the cob in summer and early fall. In winter and spring, frozen and canned corn is often supplemented with fresh corn grown in Florida. In the past, sweet corn from Florida sold in northern markets was not sweet and flavorful because the sugar content was low and it converted to starch in 2-3 days.

To improve the quality of sweet corn shipped to northern markets, corn breeders developed a new class called "supersweet". Supersweet corn contains over 30% total sugar (fructose, glucose, and sucrose) compared to normal sugary varieties (su) containing 10% total sugar, and sugar enhanced varieties (se) containing about 18% sugar (Laughnan 1953). In all supersweet varieties, which contain the shrunken 2 gene (sh2), conversion of sugar to starch is also retarded (Creech 1965). These two factors enable harvested ears to retain sweetness at least 10 days under refrigeration.

Northern growers became interested in supersweet corn because the retention of sweetness allows a more relaxed harvest schedule and consumers no longer have to rely on "same-day consumption" to insure maximum sweetness and taste. In supersweet corn, the highest sugar content occurs about 24 days after silk has formed in about half of the plants (Creech 1965). If harvested at the highest sugar content, the grower or consumer can maintain sweetness in refrigerated ears up to 7-10 days.

The earliest developed supersweet corn varieties, released in the 1960s and 1970s had several characteristics that adversely affected yield and quality (Wong et al. 1994). Tough pericarps surrounding the endosperm produced kernels that were chewy. Incomplete coverage by the husks resulted in unsightly exposed ear tips. Seed vigor was poor in cool soil at the expense of stand density. Planting had to be delayed until the soil warmed to 60-65F compared to normal sweet corn that germinates at temperatures as low as 50F. Tough pericarps and poor tip coverage have been largely eliminated by plant breeders. Although cool soil tolerance has been improved, seedsmen still caution against planting until the soil warms to 60-65F for most cultivars.

To improve cool soil tolerance, geneticists have developed a new class of sweet corn that contains the genes of normal sugary (su), sugar enhanced (se), and shrunken2 (sh2) in the same ear. This new class, called Sweet Breed™, has improved cool soil tolerance and attains a high sugar content (about 28%) (Mark Willis, Harris Seeds, personal communication).

Current outlook. Among all vegetables grown in Connecticut, sweet corn ranks first in acres grown and cash value. According to the New England Agricultural Statistics Service, Connecticut growers planted 5,700 acres of sweet corn in 1999, a 5.5% increase compared to 1998. A statewide severe drought reduced the acres harvested to 3,800 acres, a decrease of 18.4% compared to 1998. The cash value in 1999 was 4.6 million dollars compared to 9.9 million dollars in 1998 (Anon. 2000).

Much of the sweet corn produced is sold through roadside stands and farmers markets. Approximately 560 farms sell direct through roadside stands where a variety of fruit, vegetables, bedding plants, and Christmas trees are offered in season (Anon. 1989). Currently there are 65 farmers markets in Connecticut serving all major cities and densely populated suburbs. About 120 farmers participate in the markets whose gross receipts in 1999 were about 1.5 million dollars (Conn. Department of Agriculture, personal communication). To produce early harvests of sweet corn, when prices are highest, many farmers cover their fields with clear plastic mulch to heat the soil for early germination.

In this Bulletin, I report the yield and quality of six white supersweet corn cultivars and five Sweet Breed™ cultivars grown in three successive crops at Windsor and Mt. Carmel in 1997 and 1998. I also report germination tests in cool soil of all 11 cultivars in three plantings from April 22 to May 8, 1998 at both sites. Finally, I discuss strategies to maximize yield and profit through cultivar selection and the use of

clear plastic mulch or Reemay row covers to allow early planting and harvest when prices are highest.

METHODS AND MATERIALS

Soils. The white supersweet and Sweet Breed™ corn trials were conducted at the Valley Laboratory, Windsor, on Merrimac sandy loam, a well drained terrace soil with somewhat limited moisture holding capacity, and at Lockwood Farm, Mt. Carmel on Cheshire fine sandy loam with moderate moisture holding capacity.

Cultivars. Seeds were obtained from several domestic suppliers. In 1997, six cultivars of white supersweet corn were evaluated for yield and quality. They included early-maturing Sweet Magic (74 days), and Snow Bird (74 days), main-season cultivars Ultra (78 days), and Summer Sweet 7101 (78 days), and late-maturing How Sweet It Is (87 days), and Pegasus (90 days). In 1998, five Sweet Breed™ cultivars were evaluated for yield and quality. They included early-maturing Sweet Riser (yellow-68 days), and Sweet Chorus (bicolor-67 days), and main-season Sweet Rhythm (bicolor-74 days), Sweet Symphony (bicolor-76 days), and Sweet Ice (white-74 days). In 1998, all white supersweet and Sweet Breed™ cultivars were tested for cool soil tolerance in three plantings from April 22 to May 8 at both sites. All seeds had been treated with fungicide to minimize rotting.

Fertilization. Before planting, the soils in all trials were fertilized with 10-10-10 at a rate of 110 lb N/acre at Windsor, and 120 lb N/acre at Mt. Carmel. The soil at Windsor was sidedressed with urea 4 weeks after planting at a rate of 50 lb N/acre. The soil at Mt. Carmel was sidedressed 4 weeks after planting with ammonium nitrate at a rate of 30 lb N/acre. The pH of the soil at both sites was greater than 6.2 and did not require lime.

CULTURE

Cool soil germination tests. To determine tolerance for germination in cool soil, 11 cultivars (six white supersweet and five Sweet Breed™) were planted in a split block design at both sites in three plantings, April 22-24, April 29-30, and May 7-8, 1998. In each planting, the rows, 66 feet long, were spaced 3 feet apart. Each row was divided into 20-foot segments forming three 20 x 33-foot blocks, each separated by a 3-foot aisle. Seeds of each cultivar were planted at 10-inch intervals within rows. After planting, one block was covered with strips of 1.1 mil slit clear plastic polyethylene film and another was covered with Reemay spun-bonded polyester row covers. The remaining control block was uncovered. All covers were pinned to the soil with 6-inch wide heavy duty staples whose prongs penetrated the soil 5 inches. In successive plantings, the treatments were randomly placed. After 7 and 14 days, the covers were temporarily peeled back in each planting and the emerging seedlings counted. After 28 days, all covers were removed for final counts of germinating seeds. Maximum soil temperatures were recorded daily at a 1-inch depth at three sites within each block from April 22 through May 27.

Cultivar evaluation. In 1997, six white cultivars were evaluated for yield and quality in three plantings at both sites. Crop 1 was seeded May 20-22, Crop 2, June 9-10, and Crop 3, July 7-8. In 1998, five Sweet Breed™ cultivars were evaluated for yield and quality in three plantings at both sites. Crop 1 was seeded June 3-4, Crop 2, June 17-18, and Crop 3, July 7-8. Each planting consisted of six (1997) or five (1998) 12 x 12-foot randomized blocks in four replications. Each block, surrounded by a 3-foot aisle, consisted of four rows of a single cultivar spaced 3 feet apart. Seeds were planted 10 inches apart within rows producing a potential plant density of 60 plants/block. In 1998, all blocks were irrigated once with 1 inch of water at both sites.

Weed control. A pre-emergence application of Bullet (alachlor + atrazine at 3 qt/acre) was applied to all germination and cultivar evaluation plots. In the germination trials, Bullet was applied immediately after planting. The clear plastic mulch and Reemay row covers were applied after a 2-day re-entry period.

Insect control. At Windsor, corn ear worms and European corn borers were controlled with Asana XL (esfenvalerate at 9.6 oz/acre) in the pre-tassel stage. At Mt. Carmel, Sevin (carbaryl at 1.5 qt/acre) was similarly applied.

Harvest and grading. Ears were harvested when they reached full maturity (milk stage). Ten ears were randomly picked from the center two rows of each four-row block to determine average ear weight, length, and median rows of kernels. The ears were graded for quality and uniformity. Grading of ears relies on visual evaluation, i.e. straightness of the ear and rows of kernels and completeness of the rows. Poor tip fill, base fill, and incomplete rows of kernels result from incomplete pollination, which may be caused by local weather conditions when pollination occurs. High winds blowing across the rows may cause incomplete transfer of pollen from tassel to silk (Splitstoesser 1979). Poor pollination may also occur if the plants are under moisture stress (Yamaguchi 1983).

All ears were graded as follows:

Grade 1. Marketable ears, greater than 6 inches, with straight rows from tip to base, and no internal skips within rows or disappearance of rows along the axis of the ear.

Grade 2. Marketable ears, greater than 6 inches, with occasional skips along the row or rows that terminate along the axis. Also included are ears with incomplete base or tip fill less that 1 inch from base or tip or rows that are slightly skewed along the axis.

Grade 3. Unmarketable ears whose incomplete base or tip fill exceeds 1 inch or with rows that are incomplete or highly skewed along the axis. Ears less than 6 inches long were also included in this grade.

Rainfall. Rainfall distribution throughout the growing season (April-October) for 1997-1998 is shown in Table 1.

The rainfall in each column represents the departure from the mean monthly rainfall for Hartford (near Windsor) and Mt. Carmel reported by the National Weather Service. Total rainfall during the 1997 and 1998 growing seasons was 22.2 and 29.5 inches at Windsor, respectively and 22.1 and 33.9 inches at Mt. Carmel, compared to a 30-year average of 22.9 inches at Windsor and 25.0 inches at Mt. Carmel. Although total rainfall in the 1997 growing season at Windsor was near normal, water deficits between 0.6 and 2.4 inches were observed in June, September and October. At Mt. Carmel, water deficits from 1.5 to 2.4 inches occurred in May, July, and September. Heavy rains in August, exceeding 8.1 inches, nullified deficits in other months.

Table 1. Departure from normal rainfall (inches) during the 1997 and 1998 growing seasons (April-October) at Windsor and Mt. Carmel.

	WINDSOR		MT CARMEL	
	1997	1998	1997	1998
APRIL	-1.0	-0.4	0.1	1.2
MAY	0.2	4.1	-1.5	2.3
JUNE	-0.6	4.9	0.0	7.5
JULY	1.6	-0.9	-1.7	-2.2
AUGUST	2.6	-1.9	5.2	2.0
SEPTEMBER	-2.4	-1.6	-2.4	-1.3
OCTOBER	-1.2	2.3	-1.6	0.2

Although total rainfall in the 1998 growing season at Windsor was 6.6 inches above normal, deficits between 0.9 and 1.9 inches occurred consecutively in July, August, and September. In May and June, total rainfall reached 15.5 inches. Heavy rains in May reduced germination of most cultivars in Crop 3 of the cool soil germination tests at Windsor.

At Mt. Carmel, total rainfall during the 1998 growing season was 11.0 inches above normal but deficits of 2.2 and 1.3 inches occurred in July and September, respectively. In May and June, total rainfall reached 16.0 inches. Heavy rains in late May reduced germination in uncovered plots in cool soil germination tests.

COOL SOIL GERMINATION TESTS

In the past, germination of supersweet corn was reputed to be poor in cool soil, a characteristic that concerned many northern growers. Although many new cultivar releases offer improved vigor, seedsmen continue to suggest that planting should be delayed until soil temperatures rise above 60-65 F to insure satisfactory germination.

Recently, corn breeders have combined the shrunken2 gene (sh2) of supersweet corn with genes from sugary enhanced (se) and normal sugary (su) sweet corn to produce hybrids that not only have high sugar contents but improved cool soil vigor. A group of these hybrids, called Sweet Breed™ is reported by seedsmen to have excellent vigor when planted in soil with temperatures in the 50-55F range. Let us now examine the effect of row covers on soil temperature, days to germination, germination percent, and days to maturity.

Soil temperature. For early supersweet corn plantings, soil temperature in the vicinity of the planted seed (0.75-1.0 inch depth) can be increased with slit clear plastic mulch or Reemay row covers to allow successful plantings in April (Hill 1998). Soil temperatures measured during cool soil germination tests in successive plantings April 22-24, April 29-30, and May 7-8, demonstrated the magnitude of the temperature increase averaged over both sites (Table 2). In the April 22-24 planting, average maximum soil temperature increased 14F under clear plastic mulch, and 9F under Reemay row covers compared to bare soil. In the April 29-30 and May 7-9 plantings, clear plastic mulch raised soil temperatures 8-9F while Reemay raised temperatures 4-5F compared to bare soil. Thus, the heating effect provided by both covers was more pronounced in mid April than in late April and early May as the average maximum soil temperature in bare soil increased from 71F in late-April to 88F in mid May.

Table 2. Average maximum temperature (degrees F) at 1-inch depth beneath clear plastic mulch, Reemay row covers, and bare soil on clear days, April 27-May 27 during germination at Mt. Carmel.

	Clear plastic mulch	Reemay row covers	Uncovered control	Ambient air
CROP1 (April 27-May 7)				
	86	81	71	72
CROP 2 (May 8-May 18)				
	92	88	84	78
CROP 3 (May 19-May 27)				
	97	93	88	82

Clear plastic mulch and Reemay row covers not only increased soil temperatures but would have protected newly emerging seedlings 2-3F below freezing (Ferro et al. 1999),

Table 3. Effect of clear plastic mulch or Reemay row covers on average days to germination, average germination percent, and average days to maturity in three plantings of white supersweet (WS) and Sweet Breed™(SB) corn cultivars at Windsor and Mt. Carmel, 1998.

	WINDSOR			MT. CARMEL		
	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover
Planting Date		APRIL 24			APRIL 22	
Days to germination	6	7	10	6	8	17
Germination % (WS)	63	64	51	54	67	*
Germination % (SB)	96	98	69	84	94	*
Days to Maturity (WS)	91	90	94	96	95	*
Days to Maturity (SB)	81	84	88	90	88	*
Planting Date		APRIL 30			APRIL 29	
Days to germination	7	9	12	8	10	13
Germination % (WS)	72	67	60	42	65	*
Germination % (SB)	88	62	87	88	93	*
Days to Maturity (WS)	91	90	90	90	86	*
Days to Maturity (SB)	81	81	82	83	82	*
Planting Date		MAY 7			MAY 8	
Days to germination	8	9	12	8	9	11
Germination % (WS)	24	41	31	59	82	71
Germination % (SB)	55	62	73	66	67	51
Days to Maturity (WS)	89	84	88	85	86	86
Days to Maturity (SB)	78	79	79	80	80	82

*Extensive damage by crows and geese on uncovered plots.

however no freezing temperatures occurred in 1997 and 1998 after the plots were covered.

Days to germination. In three plantings at both sites, the average days to germination of six white supersweet cultivars and five Sweet Breed™ cultivars, in plots covered with clear plastic mulch, was shortened 4-5 days at Windsor and 3-11 days at Mt. Carmel compared to uncovered controls (Table 3). In plots covered with Reemay, average germination of the 11 cultivars in three plantings was shortened 3 days at Windsor and 2-9 days at Mt. Carmel compared to uncovered controls. In all plantings at both sites, days to germination of individual cultivars within each planting spanned about 5 days. Early-maturing cultivars were consistently the first to emerge and late-maturing cultivars were the last to appear.

Germination percent. At Windsor, clear plastic mulch and Reemay row covers increased average germination of white supersweet cultivars 7-12% in April 24 and April 30 plantings, respectively, compared to uncovered controls (Table 3). In the April 24 planting, average germination of Sweet Breed™ cultivars increased 27-29% compared to uncovered controls. No benefits accrued in white supersweet or Sweet Breed™ cultivars under either cover in the April 30 and the May 7 planting. Heavy rains in May reduced average germination in covered and uncovered plots compared to average germination in April plantings. It is also clear that Sweet Breed™ cultivars have greater germination rates than most white supersweet cultivars.

At Mt. Carmel, average germination of white supersweet cultivars and Sweet Breed™ cultivars under Reemay row covers exceeded the average germination under clear plastic mulch in both April plantings. No comparison could be made between germination in covered and uncovered plots because of extensive crow and goose damage in the uncovered plots. In the May 8 planting, average germination of Sweet Breed™ cultivars under both covers increased 15% compared to uncovered controls. Average germination of white supersweet cultivars increased 11% under Reemay row cover but decreased 12% under clear plastic mulch compared to the uncovered control.

Average germination rates portray a general picture of germination in covered and uncovered plots in each planting at both sites. Let us now look at the germination successes and failures of individual cultivars in each planting. In Tables 4 and 5, two benchmarks of germination were chosen to evaluate success or failure. The 75% benchmark (+) was chosen because it represents the germination standard for sweet corn published in the Federal Register (Anon 1994).

Table 4. White cultivars of supersweet corn and Sweet Breed™ cultivars exceeding 75% (+) and 90% (++) germination in April 24 (1), April 30 (2) and May 7 (3) plantings on plots covered with clear plastic mulch, Reemay row covers, or uncovered controls at Windsor, 1998.

	Clear Plastic Mulch			Reemay Row Covers			Uncovered Control		
WHITE CULTIVARS	1	2	3	1	2	3	1	2	3
How Sweet It Is	-	-	-	-	-	-	-	-	-
Pegasus	++	-	-	+	-	-	-	++	-
Snow Bird	-	+	-	-	+	-	-	-	-
Summer Sweet 7101	+	-	-	-	-	-	-	-	-
Sweet Magic	+	+	-	++	+	-	+	-	-
Ultra	+	++	-	+	+	-	-	+	-
SWEET BREED™ CULTIVARS									
Sweet Chorus	++	++	-	++	-	-	-	+	-
Sweet Ice	++	++	-	++	-	-	-	+	-
Sweet Rhythm	++	-	-	++	+	+	-	++	+
Sweet Riser	++	++	-	++	-	+	+	++	+
Sweet Symphony	++	+	-	++	+	-	+	+	+

Table 5. White cultivars of supersweet corn and Sweet Breed™ cultivars exceeding 75% (+) and 90% (++) germination in April 22 (1), April 29 (2) and May 8 (3) plantings on plots covered with clear plastic mulch, Reemay row covers, or uncovered controls at Mt. Carmel, 1998.

	Clear Plastic Mulch			Reemay Row Covers			Uncovered Control		
WHITE CULTIVARS	1	2	3	1	2	3	1	2	3
How Sweet It Is	-	-	-	-	-	-	*	*	-
Pegasus	-	-	+	+	+	++	*	*	-
Snow Bird	-	-	-	-	-	+	*	*	+
Summer Sweet 7101	-	-	-	-	-	+	*	*	-
Sweet Magic	+	++	-	++	++	+	*	*	++
Ultra	+	-	-	+	+	++	*	*	+
SWEET BREED™ CULTIVARS									
Sweet Chorus	+	+	-	++	+	-	*	*	-
Sweet Ice	+	++	++	++	++	++	*	*	+
Sweet Rhythm	+	+	-	++	+	-	*	*	-
Sweet Riser	+	++	++	++	++	++	*	*	-
Sweet Symphony	++	-	-	+	++	-	*	*	-

* Extensive damage by crows and geese on uncovered controls.

Seed lots of sweet corn whose germination is below 75% cannot enter interstate commerce. Germination is tested under controlled laboratory conditions to establish the 75% benchmark. Under field conditions, however, the germination rate may fall below the standard. The 75% standard represents a rate that will produce a harvest that will exceed 1600 dozen ears/acre 50% of the time. The second benchmark, the 90% germination rate (++), will produce a harvest of 1600 dozen ears/acre 100% of the time. At this harvest rate the total production costs including clear plastic mulch or Reemay row covers (materials and labor) will be fully met with additional profit. This subject is more fully discussed in the MANAGEMENT section.

At Windsor, despite low average germination of 63-72%

in covered plots in both April plantings (Table 3) several white supersweet cultivars exceeded the established benchmarks (Table 4). Germination of Sweet Magic and Ultra exceeded 75% under clear plastic mulch and Reemay row covers in both April plantings. Pegasus also exceeded 75% germination under both covers but only in the April 24 planting. Germination of Snow Bird exceeded 75% under both covers in the April 30 planting. In the May 7 planting, no white supersweet cultivars reached 75% germination. How Sweet It Is, and Summer Sweet 7101 had low germination in all plantings at both sites.

In contrast, germination of all Sweet Breed™ cultivars exceeded 90% under both covers in the April 24 planting (Table 4). In the April 30 planting, germination of Sweet Chorus, Sweet Riser, and Sweet Ice exceeded 90% under clear plastic mulch only. In uncovered controls, germination of Sweet Riser and Sweet Symphony exceeded 75% in all plantings while Sweet Rhythm exceeded 90% in two of three plantings. Sweet Chorus and Sweet Ice benefited most from clear plastic mulch. Germination of Sweet Rhythm, Sweet Riser, and Sweet Symphony was often higher under both covers, but they also achieved high rates without covers.

At Mt. Carmel, germination of white supersweet cultivar Sweet Magic exceeded 75% in both April plantings under clear plastic mulch (Table 5). Germination of Ultra exceeded 75% under clear plastic mulch only in the April 22 planting. Under Reemay row covers, germination of Sweet Magic, Ultra, and Pegasus exceeded 75% in all three plantings. In the May 8 planting, germination of Sweet Magic exceeded 90% while Snow Bird and Ultra exceeded 75% without cover. Germination data from the uncovered plots in the April 22 and April 29 plantings were not collected because of extensive damage by crows and geese.

Among the Sweet Breed™ cultivars, Sweet Ice and Sweet Riser exceeded the 75% benchmark in all three plantings under clear plastic mulch and Reemay row covers (Table 5). Germination of Sweet Chorus and Sweet Rhythm exceeded 75% in the April 22 and April 29 plantings under both covers. In the May 8 planting, without covers, all cultivars, except Sweet Ice, germinated poorly. Although germination data in uncovered plots of Sweet Breed™ cultivars for the April 22 and April 29 plantings could not be collected because of bird damage, there was ample evidence from scattered plant remains, that germination probably exceeded both benchmarks in all cultivars.

Days to maturity. Days to maturity is important to estimate the date of first harvest. The maturity information supplied by seedsmen are general estimates from data gathered from a broad geographical area. The best use of this information is to determine the relative maturity among cultivars offered in their catalogues. Maturity, however, depends on seasonal differences in temperature, moisture supply, and daylength. What effect did the warming temperatures and increasing daylength between the first planting on April 21-22 and the last planting on May 7-8 have on the average maturity of all cultivars? For the full expression of the effect of temperature and daylength on maturity, examination of the cultivars in the uncovered plot at Windsor informs us that the average maturity of the white supersweet corn decreased 6 days between April 22 and May 7 plantings. Maturity of Sweet Breed™ cultivars decreased in the same time interval (Table 3). Decrease in the average maturity of white supersweet and Sweet Breed™ cultivars in covered plots was somewhat modified, i.e. decrease of 2-3 days, respectively, in plots covered with clear plastic mulch, and 5-6 days respectively, in plots covered with Reemay row covers.

The span of maturity of individual cultivars within each planting at Windsor (i.e. the difference in days to maturity of early-maturing cultivars vs. days to maturity of late maturing cultivars) varied 9-14 days for all white supersweet cultivars and 4-5 days for all Sweet Breed™ cultivars. These spans are somewhat less than the spans of maturity for white supersweet cultivars (16 days) and Sweet Breed TM cultivars (12 days) listed in seed catalogues. The span of maturity estimates the number of harvest days that can be expected from a single planting of several cultivars having early to late maturity.

CULTIVAR EVALUATION

In 1997 and 1998, yield and quality of the ears from six cultivars of white supersweet corn and five cultivars of Sweet Breed™ corn, respectively, were evaluated for three plantings at Windsor and Mt. Carmel.

Ear characteristics—white supersweet. In Crop 1 at Windsor (May 20 planting), the average ear length of Summer Sweet 7101 was greatest (8.1 inches) while How Sweet It Is had the heaviest ears, 9.6 ounces (Table 6). The heavy weight of How Sweet It Is was due to a greater number of rows of kernels (18) compared to all others (16). The average ears of Pegasus, and Sweet Magic neared 9.0 ounces in weight and How Sweet It Is neared 8.0 inches in length. Although the ears of Summer Sweet 7101 were longest among all white supersweet cultivars, their weight was below average.

In Crop 1 at Mt. Carmel (May 10 planting), Pegasus had the heaviest ears (8.0 ounces) and Summer Sweet 7101 the longest ears (7.8 inches). The median number of rows of kernels was 16 in all cultivars, except Snow Bird (14 rows).

In Crop 2 at Windsor (June 9 planting), average ear weight and length decreased slightly compared to Crop 1 at Windsor. Pegasus had the heaviest ears (9.8 ounces) and Summer Sweet 7101 had the longest ears (7.6 inches). The ear weight of How Sweet It Is and Ultra was above average because the median number of rows of kernels was greatest (18). The ear length of How Sweet It Is and Pegasus was greater than average.

In Crop 2 at Mt. Carmel (June 10 planting), the average

Table 6. Characteristics of white supersweet corn ears grown at Windsor and Mt. Carmel, 1997.

	WINDSOR			Mt. CARMEL		
	Avg. Weight[x] Oz.	Avg. Length[x] In.	Median Rows No.	Avg. Weight[x] Oz.	Avg. Length[x] In.	Median Rows No.
CROP 1 (Planted May 20-22)						
How Sweet It Is	9.6*a*	7.8*ab*	18	7.1*b*	7.6*a*	16
Pegasus	8.9*ab*	7.3*b*	16	8.0*a*	7.1*a*	16
Snow Bird	8.5*ab*	7.2*b*	16	6.8*b*	7.0*a*	14
Summer Sweet 7101	8.4*ab*	8.1*a*	16	7.5*ab*	7.8*a*	16
Sweet Magic	8.9*ab*	7.4*b*	16	7.4*ab*	7.1*a*	16
Ultra	7.8*b*	7.4*b*	16	7.0*b*	7.5*a*	16
CROP 2 (Planted June 9-10)						
How Sweet It Is	8.9*ab*	7.5*ab*	18	9.4*a*	7.6*a*	16
Pegasus	9.8*a*	7.4*ab*	16	8.9*ab*	7.2*a*	16
Snow Bird	7.8*bc*	6.7*b*	16	7.4*bc*	7.2*a*	16
Summer Sweet 7101	7.7*bc*	7.6*a*	16	9.8*a*	7.6*a*	18
Sweet Magic	7.3*c*	7.1*ab*	16	6.8*c*	7.1*a*	16
Ultra	8.5*ab*	7.2*ab*	18	7.8*b*	7.2*a*	16
CROP 3 (Planted July 7-8)						
How Sweet It Is	8.2*a*	6.8*ab*	18	7.2*a*	6.2*a*	16
Pegasus	8.0*ab*	6.8*ab*	16	7.1*a*	6.5*a*	16
Snow Bird	7.2*c*	6.4*b*	16	6.3*b*	6.1*a*	14
Summer Sweet 7101	7.7*bc*	7.0*a*	18	7.0*a*	6.2*a*	16
Sweet Magic	7.6*bc*	6.6*ab*	16	7.1*a*	6.2*a*	18
Ultra	8.2*a*	6.6*ab*	18	6.1*b*	6.0*a*	16

[x] Mean separation within columns by Tukey's HSD multiple comparison test at p = 0.05. Values in columns followed by the same letter within each crop did not differ significantly.

weight of all cultivars was 1 ounce greater than the average weight in Crop 1 at Mt. Carmel. Average length, however, was about the same. Summer Sweet 7101 had the heaviest (9.8 ounces) and the longest (7.6 inches) ears and the greatest median number of rows of kernels (18). The ear weight of How Sweet It Is and Pegasus was above average and How Sweet It Is was also above average in length.

In Crop 3 at Windsor (July 7 planting), average weight and length of all cultivars declined about 7% compared to Crops 1 and 2 at Windsor, probably in response to moisture deficits in September and early October. Average weight of How Sweet It Is and Ultra was greatest (8.2 ounces) among all cultivars. Average length of Summer Sweet 7101 was greatest (7.0 inches) among all cultivars. How Sweet It Is and Pegasus were above average in length.

In Crop 3 at Mt. Carmel (July 8 planting), average weight of How Sweet It Is, Pegasus, and Sweet Magic exceeded 7.0 ounces. Average length of Pegasus was greatest among all cultivars (6.5 inches). Sweet Magic had the greatest median number of rows (18) and Snow Bird had the least (14).

Ear characteristics—Sweet Breed™. In Crop 1 (June 3 planting) at Windsor, Sweet Symphony (bicolor) had the greatest ear weight (8.5 ounces) and length (7.8 inches) among all Sweet Breed™ cultivars (Table 7). Sweet Chorus (bicolor) was above average in ear weight and length. The weight and length of Sweet Riser (yellow) was below average for all Sweet Breed™ cultivars.

In Crop 1 at Mt. Carmel (June 4 planting), average weight and length of all Sweet Breed™ cultivars was 21% and 6% less, respectively, than in Crop 1 at Windsor. Sweet Rhythm (bicolor) had the greatest average weight (6.9 ounces) and Sweet Ice (white) had the greatest length (7.4 inches). Sweet Symphony was above average for weight and length.

In Crop 2 at Windsor (June 17 planting), average weight of Sweet Chorus (8.8 ounces) and average length of Sweet Ice (7.5 inches) was greatest among all Sweet Breed™ cultivars. Lengths of Sweet Chorus and Sweet Rhythm were above average for the crop.

In Crop 2 at Mt. Carmel (June 18 planting), average weight of Sweet Symphony was greatest among all Sweet

Table 7. Characteristics of bi-color (BC), yellow (Y), and white (W) Sweet Breed™corn ears grown at Windsor and Mt. Carmel, 1998.

	WINDSOR			MT. CARMEL		
	Avg. Weight[x] Oz.	Avg. Length[x] In.	Median Rows No.	Avg. Weight[x] Oz.	Avg. Length[x] In.	Median Rows No.
CROP 1 (Planted June 3-4)						
Sweet Chorus (BC)	8.4*a*	7.5*a*	14	6.3*b*	7.0*a*	12
Sweet Ice (W)[y]	7.4*b*	7.6*a*	16	6.6*ab*	7.4*a*	16
Sweet Rhythm (BC)	8.0*ab*	7.2*a*	16	6.9*a*	6.9*a*	16
Sweet Riser (Y)	7.6*b*	6.7*b*	14	6.2*b*	6.9*a*	14
Sweet Symphony (BC)	8.5*a*	7.8*a*	16	6.8*a*	7.0*a*	16
CROP 2 (Planted June 17-18)						
Sweet Chorus (BC)	8.8*a*	7.4*a*	14	7.4*ab*	7.4*a*	12
Sweet Ice (W)[y]	7.4*c*	7.5*a*	16	6.8*b*	7.2*a*	16
Sweet Rhythm (BC)	8.0*ab*	7.4*a*	16	8.1*a*	7.2*a*	16
Sweet Riser (Y)	7.9*b*	6.8*a*	14	6.9*b*	6.7*b*	16
Sweet Symphony (BC)	8.0*ab*	7.0*a*	16	8.4*a*	7.2*a*	16
CROP 3 (Planted July 7-8)						
Sweet Chorus (BC)	7.2*b*	6.9*ab*	12	4.6*b*	5.7*a*	12
Sweet Ice (W)	8.1*a*	7.4*a*	14	4.8*ab*	6.0*a*	14
Sweet Rhythm (BC)	8.3*a*	6.7*b*	16	5.4*a*	6.0*a*	14
Sweet Riser (Y)	6.4*c*	6.5*b*	14	4.5*a*	5.4*b*	12
Sweet Symphony (BC)	7.9*ab*	7.1*ab*	16	4.9*ab*	6.0*a*	14

[x] Mean separation within columns by Tukey's HSD multiple comparison test at p=0.05. Values in columns followed by the same letter within each crop did not differ significantly.

[y] Planted June 15-16 (CROP 1), and June 29-30 (CROP 2) to isolate this white cultivar from yellow and bi-colors to avoid cross-pollination. Sweet Ice was not isolated by planting time in CROP 3 due to lateness of season.

Breed™ cultivars. The weight of Sweet Rhythm was above average. The average length of Sweet Chorus was greatest among all Sweet Breed™ cultivars but the median number of rows was lowest (12).

In Crop 3 at Windsor (July 8 planting), average weight and length of all cultivars declined about 5%, compared to Crops 1 and 2 at Windsor. Average weight of Sweet Rhythm was greatest (8.3 ounces) while Sweet Ice and Sweet Symphony were above average. Average length of Sweet Ice was greatest (7.4 inches) while Sweet Symphony was above average.

In Crop 3 at Mt. Carmel (July 7 planting), the average weight and length of all cultivars declined 56% and 22%, respectively, compared to Crop 2 at Mt. Carmel. The crop was stunted by rain deficits in September and early October (Table 1) and produced ears that were largely unmarketable (less than 6 inches). A few marketable ears of Sweet Ice, Sweet Rhythm, and Sweet Symphony were harvested.

Grades—white supersweet. In Crop 1 at Windsor, ears of the six cultivars averaged 89% Grade 1, and 12% Grade 2 (Table 8). Grade 2 ears of Ultra (38%) and Snow Bird (12%) displayed incomplete base fill.

In Crop 1 at Mt. Carmel, ears of the six cultivars averaged 86% Grade 1, 12% Grade 2, and 2% Grade 3. Again, Ultra (29%) and Snow Bird (15%) had the most Grade 2 ears because of incomplete base fill.

In Crop 2 at Windsor, ears of the six cultivars averaged 97% Grade 1, 2% Grade 2, and 1% Grade 3. Incomplete base fill was observed in 12% of Snow Bird.

In Crop 2 at Mt. Carmel, ears of the six cultivars averaged 73% Grade 1, 22% Grade 2, and 5% Grade 3. Grade 2 ears with incomplete tip fill were observed in Snow Bird (45%) and Ultra (28%). Fully 27% of Snow Bird's ears were unmarketable (Grade 3) due to incomplete tip and base fill and numerous skips in kernels along the row.

In Crop 3 at Windsor, ears of the six cultivars averaged 96% Grade 1, and 4% Grade 2. Snow Bird had the most Grade 2 ears (12%) due to incomplete base fill.

In Crop 3 at Mt. Carmel, ears of the six cultivars averaged 59% Grade 1, 38% Grade 2, and 3% Grade 3. Grade 2 ears of Snow Bird (73%), Ultra (57%), and Pegasus (50%) displayed incomplete base or tip fill.

Table 8. Distribution by grade of white supersweet corn grown at Windsor and Mt. Carmel, 1998.

	WINDSOR			MT. CARMEL		
	Grade 1 %	Grade 2 %	Grade 3 %	Grade 1 %	Grade 2 %	Grade 3 %
CROP 1						
How Sweet It Is	95	5	0	98	2	0
Pegasus	92	8	0	95	5	0
Snow Bird	88	12	0	85	15	0
Summer Sweet 7101	98	2	0	75	13	12
Sweet Magic	98	2	0	88	12	0
Ultra	62	38	0	72	28	0
CROP 2						
How Sweet It Is	98	2	0	82	18	0
Pegasus	100	0	0	80	18	2
Snow Bird	85	12	3	28	45	27
Summer Sweet 7101	100	0	0	92	8	0
Sweet Magic	100	0	0	82	15	3
Ultra	98	2	0	72	28	0
CROP 3						
How Sweet It Is	95	5	0	80	18	2
Pegasus	100	0	0	48	50	2
Snow Bird	88	12	0	22	73	5
Summer Sweet 7101	98	2	0	82	15	3
Sweet Magic	100	0	0	78	17	5
Ultra	95	5	0	43	57	0

Table 9. Distribution by grade of Sweet Breed™corn cultivars grown at Windsor and Mt. Carmel, 1998.

	WINDSOR			MT. CARMEL		
	Grade 1 %	Grade 2 %	Grade 3 %	Grade 1 %	Grade 2 %	Grade 3 %
CROP 1						
Sweet Chorus	92	5	3	40	55	5
Sweet Ice	70	20	10	75	22	3
Sweet Rhythm	98	2	0	55	35	10
Sweet Riser	90	10	0	52	33	15
Sweet Symphony	100	0	0	76	18	6
CROP 2						
Sweet Chorus	98	2	0	90	10	0
Sweet Ice	98	2	0	82	18	0
Sweet Rhythm	75	25	0	85	15	0
Sweet Riser	78	11	11	88	10	2
Sweet Symphony	95	5	0	92	8	0
CROP 3						
Sweet Chorus	65	33	2	z	z	z
Sweet Ice	92	5	3	z	z	z
Sweet Rhythm	62	32	6	z	z	z
Sweet Riser	92	8	0	z	z	z
Sweet Symphony	88	12	0	z	z	z

z There were insufficient ears on stunted plants to establish grade distribution.

The ears of Sweet Magic, Ultra, Pegasus, and Summer Sweet 7101 in all crops at both sites had excellent tip cover. Tip cover in How Sweet It Is and Snow Bird was incomplete in 10-20% of their ears. Incomplete tip cover exposed the kernels at the tip of the ear causing unsightly greenish discoloration.

Among all cultivars, How Sweet It Is was somewhat difficult to harvest. Moderate effort was needed to wrest the ears from the plant. In all other cultivars the ears snapped readily from the main stalk.

The ears of Sweet Magic were virtually all Grade 1 (99%) in all three crops at Windsor. At Mt. Carmel, ears of Grade 1 exceeded 80% in Sweet Magic and How Sweet It Is in all three crops.

Grades—Sweet Breed™. In Crop 1 at Windsor, ears of the five cultivars averaged 90% Grade 1, 7% Grade 2, and 3% Grade 3. (Table 9). Grade 2 ears of Sweet Ice (20%) and Sweet Riser (10%) displayed incomplete tip fill. Poor pollination in Grade 3 ears of Sweet Ice (10%) caused incomplete tip fill and numerous skips along the rows of kernels.

In Crop 1 at Mt. Carmel, ears of the five cultivars averaged 60% Grade 1, 33% Grade 2, and 7% Grade 3. Grade 2 ears of Sweet Chorus (55%), Sweet Rhythm (35%), and Sweet Riser (33%) mostly had incomplete base and/or tip fill. Grade 1 ears of Sweet Symphony and Sweet Ice exceeded 75%. Low moisture at pollination in late July caused plant stress and incomplete pollination.

In Crop 2 at Windsor, ears of the five cultivars averaged 89% Grade 1, 9% Grade 2, and 2% Grade 3. The Grade 2 ears of Sweet Rhythm (25%) and Sweet Riser (11%) had incomplete tip fill. The Grade 3 ears of Sweet Riser (11%) had incomplete tip fill and many skips of kernels.

In Crop 2 at Mt. Carmel, ears of the five cultivars averaged 87% Grade 1, 12% Grade 2, and 1% Grade 3. Grade 2 ears of Sweet Ice (18%) and Sweet Rhythm (15%) had incomplete tip fill. Moisture in August at the time of pollination was adequate and improved the quality of the ears of all cultivars, compared to Crop 1 at Mt. Carmel.

In Crop 3 at Windsor, ears of the five cultivars averaged 80% Grade 1, 18% Grade 2, and 2% Grade 3. Grade 2 ears of Sweet Chorus (33%) and Sweet Rhythm (32%) had incomplete tip fill. The decline in the percentage of Grade 1 ears in Crop 3 at Windsor, compared to Crops 1 and 2, was related to stress induced by moisture deficits at the time of pollination in September (Table 1) and caused incomplete pollination in the tips of many ears.

In Crop 3 at Mt. Carmel, severe moisture stress in September and October produced stunted plants whose small ears were largely unmarketable so they were not graded.

The ears of all Sweet Breed™ cultivars had excellent tip covers with husks tightly furled and extending at least 1 inch beyond the ear tip. All cultivars had ears that readily snapped from the stalk. Among all Sweet Breed™ cultivars, bicolor Sweet Symphony was the most consistent producer of Grade 1 ears at both sites.

Germination and yield—white supersweets. In 1997, germination of all white supersweet cultivars was highly variable in all crops at both sites, and ranged from excellent to poor. In Crop 1 at Windsor, germination of all six cultivars averaged 78% compared to 84% at Mt. Carmel (Table 10). At Mt. Carmel, germination of Pegasus, Summer Sweet 7101, and Sweet Magic exceeded 90%. At Windsor, germination of Sweet Magic, and Ultra exceeded 85%. Germination of Snow Bird was below 70% at both sites.

In Crop 2 at Windsor, average germination of all cultivars was 74% at Windsor, compared to 66% at Mt. Carmel. Low germination of Crop 2 at Mt. Carmel was due to moisture deficits in the seed bed. Germination of Sweet Magic was greatest at both sites (86-89%). How Sweet It Is and Snow Bird had the lowest germination at both sites.

In Crop 3 at Windsor, germination in all cultivars averaged 71%, compared to 75% at Mt. Carmel. Improved germination in Crop 3 at Windsor, compared to Crop 1 at Windsor was due to irrigation of the seed bed following planting. Germination of Sweet Magic was excellent at both sites (88-90%) and germination of Snow Bird was poorest (55-65%).

The average production of marketable ears/plant was somewhat variable at both sites. At Windsor, the average ears/plant of all cultivars was 2.0 in Crop 1, 1.8 in Crop 2, and 1.3 in Crop 3. At Mt. Carmel, the average ears/plant of all cultivars was 1.2 in Crop 1, 1.8 in Crop 2, and 0.6 in Crop 3. In Crop 2, irrigation improved plant size and production of marketable ears. In Crop 3, drought and inadequate irrigation stunted the plants; only 60% produced one marketable ear. It is interesting to note that Snow Bird often produced 2.0 ears/plant. In these plantings, poor germination of Snow Bird created less competition within the row. The plants grew larger and produced more marketable ears/plant.

In Table 10, total ears/acre was calculated by multiplying 17,340 plants/acre (spacing 10 X 36 inches) X average ears/plant X % germination. In Crop 1 at Windsor, the average of all cultivars was 26,690 ears/acre compared to 17,915 ears/acre at Mt. Carmel. Although the average germination was greater at Mt. Carmel, only about 30% of the plants produced two marketable ears at Mt. Carmel compared to 100% of the plants at Windsor. At Windsor, the yield of Ultra exceeded 30,000 ears/acre by virtue of its high germination rate and the greatest number of ears/plant among all cultivars. The yield of Summer Sweet 7101 was also well above average. At Mt. Carmel, yield of Sweet Magic was greatest among all cultivars. Its germination rate was also highest among all cultivars. The yield of Summer Sweet 7101 was also well above average.

In Crop 2 at Windsor, the average yield was 22,275 ears/acre compared to 20,360 ears/acre at Mt. Carmel. At Windsor, there was little variation in yield among all cultivars, except How Sweet It Is whose germination was poor

Table 10. Germination, yield, and days to maturity of white supersweet corn grown at Windsor and Mt. Carmel, 1997.

	WINDSOR				MT. CARMEL			
	Germ. %	Ears/ Plant No.	Total Yield Ears/A[xy]	Maturity Days	Germ. %	Ears/ Plant No.	Total Yield Ears/A[xy]	Maturity Days
CROP 1 (Harvested August 7-19)								
How Sweet It Is	70	2.0	24,400b	91	78	1.4	19,105ab	84
Pegasus	77	2.0	26,070ab	91	90	1.2	12,350c	88
Snow Bird	68	2.1	24,705b	84	63	1.2	13,155c	77
Summer Sweet 7101	82	1.9	27,320ab	87	91	1.2	20,730ab	88
Sweet Magic	88	1.7	26,245ab	80	95	1.4	23,280a	77
Ultra	86	2.1	31,405a	84	85	1.3	18,875ab	81
CROP 2 (Harvested August 25-September 10)								
How Sweet It Is	63	1.6	17,655b	91	48	1.9	15,730c	87
Pegasus	83	1.7	24,685a	91	78	1.7	23,200ab	90
Snow Bird	65	2.1	23,940a	82	50	2.2	19,020b	80
Summer Sweet 7101	76	1.7	22,580a	87	69	1.6	19,185b	84
Sweet Magic	86	1.6	24,040a	78	89	1.7	26,310a	76
Ultra	71	1.9	23,445a	85	67	1.6	18,715b	84
CROP 3 (Harvested September 22-October 10)								
How Sweet It Is	63	1.5	16,550b	88	74	0.9	11,640a	94
Pegasus	73	1.3	16,610b	93	69	0.6	7,195b	94
Snow Bird	55	1.2	11,505c	78	65	0.5	5,700bc	76
Summer Sweet 7101	71	1.4	17,375ab	86	72	0.6	7,500b	86
Sweet Magic	90	0.9	14,055bc	78	88	0.8	12,255a	76
Ultra	75	1.4	18,300a	86	80	0.4	5,580bc	86

x Based on 17,430 plants/A (10 inch x 3-foot spacing) x ears/plant x % germination.

y Mean separation within columns by Tukey's HSD multiple comparison test at P=0.05. Values in columns followed by the same letter within each crop did not differ significantly.

(63%). At Mt. Carmel, yields of Sweet Magic and Pegasus were well above average in Crop 2.

In Crop 3 at Windsor, the average yield of all cultivars was 15,770 ears/acre compared to 8,310 ears/acre at Mt. Carmel. Lower average yield at both sites was due to moisture stress which stunted the plants and produced fewer marketable ears. At Windsor, yields of Ultra, and Summer Sweet 7101 exceeded 16,600 ears/acre, well above average. At Mt. Carmel, only yields of Sweet Magic and How Sweet It Is exceeded 11,600 ears/acre. Low yields at Mt. Carmel in Crop 3 were due to severe moisture stress in September and early October. The stunted plants produced numerous unmarketable ears.

Germination and yield—Sweet Breed™. In 1998, average germination of five Sweet Breed cultivars was excellent and remarkably constant in all three crops at both sites (93-96%). Although moisture deficits were noted (Table 1), supplementary irrigation following planting and excellent seed vigor produced excellent stands at both sites. Despite excellent germination at both sites, the average production of ears/plant was highly variable (Table 11). In Crop 1 at Windsor, average production of all cultivars was 1.5 ears/plant compared to 0.7 ears/plant at Mt. Carmel. While 50% of plants at Windsor produced two ears, only 70% of plants at Mt. Carmel produced one ear, a consequence of drought.

In Crop 2, average ears/plant of all cultivars at Windsor and Mt. Carmel was 1.2 and 1.1, respectively. Supplementary irrigation improved the production of ears at Mt. Carmel compared to Crop 1.

In Crop 3 at Windsor, average production of four cultivars was 1.0 ears/plant. At Mt. Carmel, moisture stress stunted the entire crop and very few ears reached marketable size. At Windsor, Sweet Ice was also severely stunted. Among the cultivars, Sweet Rhythm had the greatest number of ears/plant in all three crops at Windsor and one crop at Mt. Carmel.

Average total yield of all cultivars was highly variable in

Table 11. Germination, yield, and days to maturity of bi-color (BC), yellow (Y), and white (W) Sweet Breed™corn grown at Windsor and Mt. Carmel, 1998.

	WINDSOR				MT. CARMEL			
	Germ. %	Ears/ Plant No.	Total Yield Ears/A[xy]	Maturity Days	Germ. %	Ears/ Plant No.	Total Yield Ears/A[xy]	Maturity Days
CROP 1 (Harvested August 12-21)								
Sweet Chorus (BC)	96	1.5	25,150a	70	94	0.4	6,520c	70
Sweet Ice (W)	97	1.5	25,360a	61	85	0.7	10,395b	65
Sweet Rhythm (BC)	94	1.6	26,355a	72	93	0.7	11,325b	73
Sweet Riser (Y)	97	1.3	21,935b	70	96	0.9	15,090a	70
Sweet Symphony (BC)	94	1.5	24,630ab	76	97	0.6	10,165b	76
CROP 2 (Harvested August 25-September 9)								
Sweet Chorus (BC)	96	1.3	22,545a	69	98	0.9	15,295b	70
Sweet Ice (W)	99	1.0	17,220b	71	90	1.3	20,505a	72
Sweet Rhythm (BC)	95	1.4	23,135a	76	96	1.3	21,705a	67
Sweet Riser (Y)	94	1.1	18,060b	69	94	1.1	18,025b	70
Sweet Symphony (BC)	96	1.1	18,310b	76	94	1.0	16,385b	70
CROP 3 (Harvested September 18-23)								
Sweet Chorus (BC)	97	0.8	13,595b	73	97	z	z	z
Sweet Ice (W)	97	z	z	z	96	z	z	z
Sweet Rhythm (BC)	96	1.1	18,405a	78	94	z	z	z
Sweet Riser (Y)	96	0.9	15,090ab	73	96	z	z	z
Sweet Symphony (BC)	96	1.0	16,645ab	78	97	z	z	z

x Based on 17,430 plants/A (10 inch x 3-foot spacing) x ears/plant x % germination.

y Mean separation within columns by Tukey's HSD multiples comparison test at P = 0.05. Values in columns followed by the same letter within each crop did not differ significantly.

z There were insufficient marketable ears on stunted plants to establish yield or maturity.

all crops at both sites. In Crop 1 at Windsor, average yield was 24,685 ears/acre compared to 10,700 ears/acre at Mt. Carmel, a difference of 57%. The lower average yield at Mt. Carmel was due to low moisture. At Windsor, Sweet Rhythm (BC) had the greatest yield (26,355 ears/acre). The yields of Sweet Chorus (BC) and Sweet Ice (W) exceeded 25,000 ears/acre. At Mt. Carmel, Sweet Riser (Y) had the greatest yield (15,090 ears/acre) and Sweet Rhythm (BC) exceeded the average yield.

In Crop 2 at Windsor, the average yield of all cultivars was 19,855 ears/acre compared to 18,385 ears/acre at Mt. Carmel, a difference of 8%. These average yields represented a 24% decrease at Windsor and a 71% increase at Mt. Carmel, compared to average yields in Crop 1. These differences were due to moisture deficits at Windsor but adequate moisture at Mt. Carmel in August (Table 1).

In Crop 3 at Windsor, the average yield of all cultivars was 15,935 ears/acre, a decrease of 20% compared to the average yield in Crop 2. At Mt. Carmel, persistent moisture deficits in September and October severely stunted the plants and too few marketable ears were produced to quantify yields. Also contributing to yield reductions at both sites was late-season loss of plant vigor as temperatures cooled and daylength decreased.

Maturity—white supersweets 1997. Maturity of plantings under clear plastic mulch and Reemay row covers in late April and early May was discussed earlier. We will now examine maturity of cultivars planted from late May through early July. The maturities observed in the cultivar evaluation trials were measured from the planting date to the date when one-half of the ears were harvested.

The average maturity of all white supersweet cultivars in all three crops at Windsor was remarkably uniform (85-86 days) (Table 10). At Mt. Carmel, the average maturity of all cultivars varied only 3 days (82-85 days). These average maturities of all cultivars was 5-6 days longer at Windsor and 2-5 days longer at Mt. Carmel than the average maturity found in the catalogue descriptions. Although most

Table 12. Estimated yield (dozen ears/A) of white supersweet and Sweet Breed™ corn planted in late April to early May at Windsor and Mt.Carmel, 1998.

	April 22-24			April 29-30			May 7 - 8		
	Clear Plastic Mulch	Reemay Row Cover	No Cover	Clear Plastic Mulch	Reemay Row Cover	No Cover	Clear Plastic Mulch	Reemay Row Cover	No Cover
					WINDSOR				
WHITE SUPERSWEET									
Sweet Magic	1487	1871	2352	1318	1687	869	1027	1074	1004
Snow Bird	725	293	488	920	1148	614	18	130	37
Ultra	1634	1738	767	2566	1806	1634	105	1569	297
Summer Sweet 7101	1673	846	1178	716	741	786	98	502	56
How Sweet It Is	19	211	195	1325	442	244	18	37	18
Pegasus	2352	2096	966	818	1620	1336	1299	1738	1116
SWEET BREED™									
Sweet Rhythm (BC)	280	2150	672	483	878	1229	1580	1862	1810
Sweet Symphony (BC)	245	1562	1046	1636	1585	1599	1204	967	1227
Sweet Ice (W)	2092	1896	1071	1801	1176	920	941	906	1255
Sweet Chorus (BC)	280	836	1011	892	32	502	439	251	553
Sweet Riser (Y)	2092	2556	1116	962	558	1283	667	1394	878
					MT. CARMEL				
WHITE SUPERSWEET									
Sweet Magic	944	1394	x	1229	1443	x	553	1483	1729
Snow Bird	372	332	x	70	544	x	195	971	669
Ultra	669	1534	x	872	1432	x	260	1229	944
Summer Sweet 7101	325	1046	x	376	909	x	474	971	316
How Sweet It Is	46	316	x	37	56	x	153	832	302
Pegasus	553	1074	x	167	1501	x	442	948	651
SWEET BREED™									
Sweet Rhythm (BC)	604	1229	x	920	878	x	151	446	595
Sweet Symphony (BC)	669	1318	x	1264	1673	x	139	302	21
Sweet Ice (W)	767	1801	x	1452	1685	x	781	1729	971
Sweet Chorus (BC)	104	1743	x	651	1278	x	167	211	374
Sweet Riser (Y)	418	909	x	725	781	x	614	1109	167

x Extensive bird damage.

individual cultivars took 4-6 days longer to mature than catalogue maturities, Snow Bird and Summer Sweet 7101 took 9-10 days longer to mature. Late-maturing Pegasus varied only 1-3 days from catalogue maturity at both sites.

Maturity—Sweet Breed™ 1998. The average maturity of all Sweet Breed™ cultivars between sites varied only 1-2 days (Table 10). In Crops 1, 2, and 3 at Windsor, the average maturity progressively increased from 70 to 76 days as temperature and daylength decreased. There was little variation in average maturity at Mt. Carmel (70-71 days) in Crops 1 and 2. Among the individual cultivars, most maturities were within 1-3 days of catalogue maturity. One notable exception was Sweet Ice (W), whose field maturity was 9-13 days earlier at both sites in Crop 1 compared to the catalogue maturity.

MANAGEMENT

Crop covers. Clear plastic mulch and Reemay row covers are often used to produce early harvests of sweet corn (Ferro et al. 1997). Both covers increased soil temperature, speeded germination, and increased percent germination. Clear plastic, however, must be slit to allow escape of excess heat that might kill emerging seedlings. Covers must ultimately be removed to allow cultivation for weed control and sidedressing of fertilizer. Compared to slit clear plastic,

Reemay row covers increased soil temperature to a lesser degree but did not trap heat under the cover. Reemay row covers can remain on the crop during early growth to protect against corn borers, but late removal negates early cultivation.

Clear plastic mulch and Reemay row covers create additional expense. To be economically beneficial, a cover should provide additional yield to offset the cost of material and labor to install and remove it, or it should provide earlier harvest when the price for locally grown sweet corn is highest. The cost of producing an early crop of supersweet corn without clear plastic mulch or Reemay row cover is estimated to be about $625/acre. At 1998 prices, the cost of 1.1 mil slit clear plastic mulch and Reemay row cover is about $650/acre and $1250/acre, respectively, plus $150/acre for installation and removal. Thus, total production cost would be $1425/acre with slit clear plastic mulch and $2025/acre with Reemay row cover (Hill 1998). At an estimated price of $3.00/dozen ears retail at roadside stands for early harvested supersweet corn, the break-even yield would be 203 dozen ears/acre for no cover, 475 dozen ears/acre for slit clear plastic mulch, and 675 dozen ears/acre for Reemay row covers. The break-even yield at a wholesale price of $1.50/dozen ears would be 417 dozen ears for no cover, 950 dozen ears/acre for slit clear plastic mulch, and 1350 ears/acre for Reemay row covers,

The yield of each cultivar in the cool soil germination tests was calculated for each planting at both sites. The yield was based on a population of 17,430 plants/acre X the average ears/plant X % germination for each treatment.

In the April 22 planting at Windsor, clear plastic mulch increased yield in four of six white supersweet cultivars and all five Sweet Breed™ cultivars compared to yield in uncovered controls. Reemay row covers increased yield in three of six white supersweet cultivars and four of five Sweet Breed™ cultivars compared to yield in uncovered controls (Table 12). In the April 23 planting at Mt. Carmel, comparisons could not be made between covered and uncovered plots because of severe bird damage in the uncovered controls. It is noted, however, that yields of all white supersweet and Sweet Breed™ cultivars in plots covered with Reemay row covers were greater than those covered with clear plastic mulch. Both row covers protected the newly emerging seedlings from damage by crows who plucked uncovered seedlings from the soil and fed on the attached seed.

In the April 29 planting at Windsor, clear plastic mulch increased yields in five of six white supersweet cultivars and three of five Sweet Breed™ cultivars compared to yields in the uncovered control. Reemay row covers increased yield in five of six white supersweet cultivars and one of five Sweet Breed™ cultivars compared to yield in the uncovered control. Most white supersweet and Sweet Breed™ cultivars had greater yields under Reemay row covers than under clear plastic mulch.

In the April 30 planting at Mt. Carmel, severe bird damage in the uncovered control precluded comparisons between covered and uncovered plots. Yields of most white supersweet and Sweet Breed™ cultivars were greater under Reemay row covers than clear plastic mulch.

In the May 7 planting at Windsor, yield in all six white supersweet cultivars was greater in Reemay covered plots than plots covered with clear plastic mulch or uncovered controls. Yield in three of five Sweet Breed™ cultivars was greatest in the uncovered control compared to yields in covered plots.

In the May 8 planting at Mt. Carmel, greatest yields in virtually all white supersweet and Sweet Breed cultivars were observed in plots covered with Reemay row covers rather than in plots covered with clear plastic mulch or uncovered controls.

In summary, among all cultivars in all plantings at Windsor, yields were greatest in 36% of cultivars covered with clear plastic mulch, 40% of cultivars covered with Reemay row cover, and 24% of cultivars with no cover. At Mt. Carmel, yields in 6% of cultivars were greatest with clear plastic mulch, 85% with Reemay row covers, and 9% with no cover. Therefore, Reemay row covers provided greater yields while clear plastic mulch provided earlier harvests.

Irrespective of treatment, the most consistently high yielding white supersweet cultivars at Windsor were Ultra, Pegasus and Sweet Magic. Among Sweet Breed™ cultivars, Sweet Rhythm (BC), Sweet Symphony (BC), and Sweet Ice (W) consistently had the greatest yields. At Mt. Carmel, although yields were lower, white supersweet cultivars Sweet Magic, Ultra, and Pegasus and Sweet Breed™ cultivars Sweet Symphony (BC) and Sweet Chorus (BC) had the greatest yields.

Although yield increases were observed in most cultivars in plots covered with clear plastic mulch or Reemay row covers, were they great enough to offset the additional production costs? To determine profitability, the estimated yield/acre of each cultivar in Table 12 was multiplied by an estimated retail price of $3.00/dozen ears to obtain gross returns. The total production cost/acre ($1425 for clear plastic mulch, $2025 for Reemay, and $625 without cover) was then subtracted to determine net profit/acre (Table 13). It was assumed that all marketable corn ears were harvested and sold.

In the April 22 planting at Windsor, white supersweet cultivar Pegasus was clearly the most profitable cultivar grown under both covers (net profit exceeding $4,000/acre). All Sweet Breed™ cultivars were equally as profitable under clear plastic mulch while Sweet Rhythm (BC) and Sweet Riser (Y) were highly profitable under Reemay row covers. In the April 29 planting at Windsor, the white supersweet cultivar Ultra was highly profitable (exceeding $6,000/acre) under Reemay row covers. Net profit/acre of Sweet Breed cultivars Sweet Symphony (BC) and Sweet Ice (W) was

Table 13. Estimated net profit or (loss)/acre (dollars gross returns less total cost) of white Supersweet and Sweet Breed™ corn in late April to early May plantings at a retail price of $3.00/dozen ears.

	April 22-24			April 29-30			May 7-8		
	Clear Plastic Mulch	Reemay Row Cover	No Cover	Clear Plastic Mulch	Reemay Row Cover	No Cover	Clear Plastic Mulch	Reemay Row Cover	No Cover
				WINDSOR					
WHITE SUPERSWEET									
Sweet Magic	3036	3588	6426	2529	3036	1977	1657	1197	2382
Snow Bird	750	(1146)	834	1335	1419	1212	(1371)	1635)	(519)
Ultra	3477	3189	1671	6273	3393	4272	(1110)	2682	261
Summer Sweet 7101	594	513	2904	723	198	1728	(1131)	(519)	(462)
How Sweet It Is	(1368)	(1392)	(45)	2550	(699)	102	(1371)	1914)	(576)
Pegasus	5531	4263	2268	1029	2835	3378	2472	3189	2718
SWEET BREED™									
Sweet Rhythm (BC)	8415	4425	1386	24	699	3057	3315	3561	4800
Sweet Symphony (BC)	5310	2661	2508	3483	2730	4167	2187	876	3051
Sweet Ice (W)	4851	3663	2583	3978	1503	2130	1398	693	3135
Sweet Chorus (BC)	419	483	2403	1251	1929)	870	(108)	(1272)	1029
Sweet Riser (Y)	4851	5643	2718	1461	351)	3219	576	2157	2004
				MT. CARMEL					
WHITE SUPERSWEET									
Sweet Magic	807	2157	x	2262	2304	x	234	2424	4557
Snow Bird	(309)	(1029)	x	(1215)	(393)	x	840	888	1377
Ultra	582	2577	x	1191	2271	x	(645)	1662	1602
Summer Sweet 7101	(450)	1113	x	(297)	702	x	(3)	888	318
How Sweet It Is	(2187)	(1077)	x	(1314)	(1857)	x	(965)	(1329)	276
Pegasus	234	1197	x	(924)	2478	x	(90)	819	1323
SWEET BREED™									
Sweet Rhythm (BC)	387	1662	x	1335	609	x	(972)	(687)	1155
Sweet Symphony (BC)	582	1929	x	2667	2994	x	(1008)	(1119)	(567)
Sweet Ice (W)	876	3378	x	2931	3030	x	918	3162	2293
Sweet Chorus (BC)	1887	3204	x	528	1809	x	(924)	(1392)	492
Sweet Riser (Y)	(171)	702		750	318	x	417	1302	(129)

x Extensive bird damage.

about $3,000-$4,000/acre under clear plastic mulch. In the May 9 planting at Windsor, net profit was greater than average for white supersweet cultivar Pegasus ($3,189/acre) and Sweet Breed™ cultivar Sweet Rhythm (BC) under clear plastic mulch ($3,315/acre) and Reemay row cover ($3,561/acre). White supersweet cultivars Snow Bird and How Sweet It Is had low net profits or net losses in all plantings at all sites.

At Mt. Carmel, poor germination and low yield resulted in low net profit or net loss in most plantings. Exceptions were Sweet Ice (W) in April 24 and April 30 plantings under Reemay row covers, with net profit exceeding $3,000/acre. Net profit of Sweet Chorus (BC) also exceeded $3,000/acre under Reemay row covers in the April 24 planting.

Net profit was also calculated for all cultivars based on a wholesale price of $1.50/dozen ears. Considering all 11 cultivars in three plantings at both sites, a wholesale price of $1.50/dozen ears produced more losses than profits (Table 14). At Windsor, 42% of all cultivars planted under clear plastic mulch in three plantings incurred losses, some approaching $2,000/acre. Under the more expensive Reemay row covers, losses were incurred in 54% of all cultivars in three plantings. Without cover, 21% of all cultivars incurred losses. Profit in the remaining cultivars under clear

Table 14. Estimated net profit or (loss) / acre (dollars gross returns less total cost) of white Supersweet and Sweet Breed™ corn in late April and early May plantings at a wholesale price of $1.50/dozen ears.

	April 22-24			April 29-30			May 7-8		
	Clear Plastic Mulch	Reemay Row Cover	No Cover	Clear Plastic Mulch	Reemay Row Cover	No Cover	Clear Plastic Mulch	Reemay Row Cover	No Cover
				WINDSOR					
WHITE SUPERSWEET									
Sweet Magic	806	782	2998	552	506	674	116	(414)	875
Snow Bird	(675)	(1586)	102	(45)	(303)	291	(1398)	(1830)	(574)
Ultra	1026	582	520	2424	684	1821	(1268)	326	(184)
Summer Sweet 7101	1084	(729)	1137	(351)	(914)	549	(1276)	(1272)	(546)
How Sweet It Is	(1396)	(1708)	(338)	562	(1362)	(264)	(1398)	(1970)	(603)
Pegasus	2103	1119	(819)	(198)	405	1374	524	582	1044
SWEET BREED™									
Sweet Rhythm (BC)	3495	1200	378	(746)	(708)	1214	945	768	2085
Sweet Symphony (BC)	1942	318	939	1029	352	1768	391	(574)	1210
Ice (W)	1713	819	976	1276	(261)	750	(14)	(666)	1252
Sweet Chorus (BC)	3495	(771)	886	(87)	(1977)	123	(766)	(1648)	200
Sweet Riser (Y)	1713	1809	1044	18	(1188)	1294	(424)	66	687
		MT. CARMEL							
WHITE SUPERSWEET									
Sweet Magic	(309)	66	x	418	140	x	(596)	200	1964
Snow Bird	(867)	(1527)	x	(1320)	(1209)	x	(1132)	(568)	374
Ultra	(422)	276	x	(117)	123	x	(1050)	(182)	785
Summer Sweet 7101	(938)	(429)	x	(861)	(662)	x	(714)	(568)	(158)
How Sweet It Is	(1356)	(1551)	x	(1370)	(1941)	x	(1196)	(777)	(177)
Pegasus	(596)	(414)	x	(1174)	226	x	(762)	(603)	346
SWEET BREED™									
Sweet Rhythm (BC)	(519)	(182)	x	(45)	(708)	x	(1198)	(1326)	262
Sweet Symphony (BC)	(422)	(48)	x	471	484	x	(1216)	(1572)	(598)
Sweet Ice (W)	(274)	676	x	753	502	x	(254)	568	826
Sweet Chorus (BC)	231	590	x	(448)	(108)	x	(1174)	(1708)	(169)
Sweet Riser (Y)	(798)	(662)	x	(338)	(854)	x	(504)	(362)	(380)

x Extensive bird damage.

plastic mulch was meager, only 33% exceeded $1,000/acre. Net profit exceeded $1,000/acre in only 9% of cultivars under Reemay and in 18% of all cultivars without cover.

At Mt. Carmel, net profit in all plantings under clear plastic mulch was the exception rather than the rule. Fully 70% of all cultivars under clear plastic mulch incurred losses, 67% under Reemay row covers, and 45% without cover. No net profit exceeded $1,000/acre in any cultivar under either cover. At Windsor, only Sweet Breed™ cultivars Sweet Rhythm (BC) and Sweet Chorus (BC) had net profits exceeding $3,000/acre under clear plastic mulch in the April 22 planting. Their success, however, did not continue in later plantings.

To summarize, the greatest opportunity for profit was the use of clear plastic mulch for April plantings of white supersweet and Sweet Breed™ corn sold at a retail price of $3.00/dozen ears. Although yields were often higher when grown under Reemay row covers, its greater expense reduced profitability. Among all cultivars tested for cool soil germination, Snow Bird and How Sweet It Is were found to lack germination vigor in cool soil even when grown under cover.

How could profit be increased? Increased yields could be attained by assuring that soil moisture is adequate for germination. Lower yields were observed in the second and third plantings of the white supersweet cultivars because soil moisture was inadequate for germination of the shallowly-planted seeds, especially at Mt. Carmel. Delay in planting until after a rain event or irrigation after planting may increase stand density, yield, and profitability. Cost reduction can also be achieved if the cover materials could be salvaged and reused another year. In our supersweet corn trials, Reemay row covers were reused for 3 years with only about 20% being replaced in the third year. Reemay row covers removed after germination was complete (generally after 3-4 weeks) generally showed little damage. Damage would be more severe if the row covers remained several more weeks as the plants grew and exerted pressure beneath the cover. The initial cost of Reemay, amortized over 3 years, would substantially reduce costs and increase profits in the second and third year.

Cultivar selection. In selecting suitable cultivars for a sweet corn program, one must consider yield potential, quality characteristics that appeal to sight and taste, and their response to soil temperature modification by cover materials to produce early crops that are the most profitable. No white supersweet cultivars tested displayed tough kernels when harvested at full maturity. When harvested at full maturity (generally 24 days after silk appears on half of the plants) white supersweet corn maintains satisfactory sweetness 8-10 days under refrigeration and 4-6 days at room temperature. Harvest could be delayed 5-7 days following full maturity without loss of quality. Delayed harvest, however, shortens the shelf life and exposes the mature crop to damage by raccoons, skunks, and birds. Sweet Breed™ cultivars had excellent germination in early plantings under either cover. Their ears are unique because they contain a mixture of individual kernels with su (50%), se (25%), and sh2 (25%) characteristics. The full expression of sweetness does not occur until the sh2 kernels become fully mature (24 days after silk appears on half of the plants) (Mark Willis, Harris Seeds, personal communication). A harvest delay of 5-6 days beyond the onset of full maturity results in a slight but unobjectionable toughening of the kernel's pericarp.

For late-April to early-May plantings, cultivars that responded well to temperature modification by clear plastic mulch or Reemay row covers were white supersweet cultivars Sweet Magic, Ultra, and Pegasus. Among the Sweet Breed™ cultivars, the most responsive were Sweet Rhythm (BC) and Sweet Symphony (BC) under both covers. Sweet Ice (W) and Sweet Riser (Y) also had high yields under clear plastic mulch. Their profitability was enhanced by excellent yields and above-average production of ears/plant. Early maturing Sweet Magic (white supersweet) and Sweet Breed™ Sweet Riser (Y) provided the earliest harvests. A single planting of white supersweet cultivars Sweet Magic, Ultra, and Pegasus provided a harvest span of 12 days. A single planting of Sweet Breed™ cultivars Sweet Chorus (BC) and Sweet Rhythm (BC) provided a harvest span of 7 days.

For main-season plantings beyond mid May, the early maturing white supersweet cultivar Sweet Magic had the greatest yields in all plantings at Mt. Carmel and above-average yields at Windsor. It had excellent vigor and germinated well, even at moderate to low soil moisture contents. Above-average yields were also observed in Pegasus, Ultra, and Summer Sweet 7101. If ear characteristics are of prime importance, How Sweet It Is provided the heaviest ears by virtue of its 18 rows of small tender kernels. Its production of ears/plant was only slightly above average in three of six plantings.

For main-season plantings of Sweet Breed™ cultivars, Sweet Rhythm (BC) had consistently greatest yields in all plantings at both sites. Its yield is due to a high germination rate and a high percentage of plants producing two marketable ears (30-60%). Yield of Sweet Ice (W) was also above average in most plantings at both sites. In most plantings, Sweet Rhythm (BC) had the heaviest ears and Sweet Ice (W) the longest ears. All Sweet Breed cultivars had excellent tip cover.

Planting dates. From studies at Windsor and Mt. Carmel in central Connecticut, clear plastic mulch increased soil temperatures beyond mid April to produce early crops. To increase profitability, proper cultivar selection is important. Most cultivars can be planted after May 1 because soil temperature did not limit germination. The succession plantings, 7 days apart, did not produce mature crops in a similar span of time. Some early-maturing cultivars in the first and second plantings were harvested on the same day in mid July because the maturity of the second crop shortened as daily temperatures increased and daylight was near its maximum. To avoid "bunching" of harvests as the weather warms, scheduling of successive plantings using a growing degree day system (Ashley 1998) has proven successful. For earliest harvests of crops grown under clear plastic mulch or Reemay row cover, early- to mid-maturing cultivars should be used. Although late-maturing cultivars responded well to both covers, their harvests were delayed up to 12 days.

In early-July plantings for final harvest, cultivars with early- to mid-maturity (65-75 days) are preferred. At this time, late-maturing cultivars may occasionally face frost injury as they reach maturity. In the cooler soils of the Eastern and Western Highlands, suitable temperatures for supersweet corn germination may not occur until early June without use of clear plastic mulch. In May, clear plastic mulch may increase germination and profit for roadside sales.

Special requirements. Plantings of supersweet corn have special requirements. The shrunken seeds, smaller than the normal (su) or sugar enhanced (se) types, should be planted 3/4 to 1 inch deep. Planted at greater depth, germination is

poorer than with the normal or sugar enhanced types and subsequent yield decreases. Sweet Breed™ cultivars can be planted at normal depth (1.0-1.5 inches). Planting in moist soil with temperatures exceeding 60F increases germination. Some newly released cultivars of supersweet corn with increased cool soil tolerance are identified in many seed catalogues. Sweet Breed™ cultivars have excellent cool soil germination and will emerge in soil with temperatures above 55F.

Supersweet corn must be isolated from all other corn types to insure development of maximum sugar content and flavor. Since corn is pollinated by wind, isolation can be accomplished by distance or maturity. Most seedsmen recommend a distance of 250 feet between plantings of supersweet and other corn types, i.e. normal sugary (su), sugar enhanced (se), field, pop, and ornamental. Large plantings are best isolated by a distance of 500 feet, especially if located downwind at windy sites with no tree breaks. Isolation by maturity can be accomplished by separation of 10-14 days between plantings of supersweet corn and other corn types.

Sweet Breed™ bicolor and yellow cultivars do not require isolation from other sweet corn or field corn types. Although Sweet Breed™ cultivars contain 25% of kernels with the sh2 gene, they must be isolated from supersweet cultivars to prevent cross-pollination and degradation of the quality of supersweet cultivars.

All white supersweet and white Sweet Breed™ cultivars also require isolation from bicolor and yellow cultivars to insure that the white recessive gene is fully expressed. In the Sweet Breed™ cultivar evaluation trials, Sweet Ice (W) was planted among bicolor and yellow cultivars but isolated by a 10-day delay in planting. During evaluation of the ears of Sweet Ice, only about 10% of the ears contained 1-3 yellow kernels, but they did not degrade the quality of the white ear.

Supersweet and Sweet Breed™ cultivars usually develop numerous tillers (suckers) at the base of the stem. Occasionally large tillers produce marketable ears, hence, removal may reduce yield (Yamaguchi 1983).

Finally, germination of seed treated with fungicides produced a denser stand of plants, especially if germination was delayed by lack of soil moisture or excessively cool temperatures in early plantings.

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